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PLUSIA AND ALLIED GENERA WITH DESCRIPTIONS OF NEW SPECIES.

(PLATES VI-IX.)

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About six years ago I announced my intention of monographing the *Plusias* of North America, and by this time I have no doubt that many have imagined that I had abandoned the project. The truth is, that there is already sufficient confusion in the literature of entomology to render it obligatory upon a new writer to work slowly and if possible to delay publication until such time as he may have data before him, of such character as will, or should, prevent his making new errors, while attempting a correction of the old.

I must confess that even now I do not consider that I have terminated my study of this interesting group, but the promise of a new catalogue by Dr. Dyar has made it seem advisable for me to publish a paper, in which I may record the results of my investigations so far as they have gone. Having occupied myself exclusively with the identification of the names already in our list, I have made no effort to distinguish between genera, though convinced by superficial observation that the single name *Plusia* is inadequate to cover the quite divergent forms that hitherto have been thus indicated. The time being short, therefore, and feeling entirely unwilling, indeed incapable of erecting structural characters upon which to rest generic nominations, I have referred that portion of the work to Dr. Dyar, whose paper, separating the *Plusia* group into different genera is published herewith.



After admitting my ignorance of structural differentiation it would not be right for me to alter the classification of species as placed by Dr. Dyar. I have however removed one species, and will comment upon the placing of two others. *Ornata* was described by myself from a single specimen in the National Museum collection. It had been papered and probably thereby injured and much flattened. The head parts were in fair condition: at any rate the absence of any tubercle in front, and the length of the palpi separated it from *Basilodes* which it superficially resembled because of its metallic coloration. But it did not seem justifiable to erect a new genus upon so poor a specimen, and it was tentatively placed with *Deva* when described. Dr. Dyar in his manuscript list before me places it with *venusta*, *contexta* and *putnami* under *Euchalcia*, and, replying to my protest, says he cannot separate it structurally. To my mind these three make quite a distinct group, placed with which *ornata* would be such a foreigner as to make it unbelievable. Considering the condition of the type therefore, I deem it best to await the discovery of good specimens before finally classifying. It is already placed in a genus where it does not belong, but it is better there than removed to another equally doubtful. Consequently I list it with *Panchrysia* which replaces *Deva*.

Under *Plusia* Dr. Dyar lists *metallica*, at which I am surprised. While we have but three true *Plusias* in this country taking *chrysitis* as the type, the fauna of the world includes many, in which the metallic discal sign is absent. It seems odd therefore that *metallica* with its very conspicuous metallic sign should fall into this companionship.

In regard to *Syngrapha*, I should have expected to find all the species having yellow hind wings under this one genus as apparently was intended by Hübner. Structurally, however, Dr. Dyar says they separate, and I list them accordingly, with considerable surprise that *parilis* should fall here. These comments are not at all meant as adverse criticism of Dr. Dyar's classification; the points mentioned simply appear to me of sufficient importance to be noted.

My first special interest in *Plusia* began from the fact that I found myself in possession of more forms than I could find in any one collection, and furthermore because, in going from one collection to another, to obtain names for my material, I discovered a sad confusion in identification. For example *pseudogamma* was nearly everywhere labeled *monodon*, which may account for the fact that Professor

Smith subsequently renamed the true *monodon*, calling it *insolita*. My own accession of material was largely due to my work in the White Mountain region, where it may be interesting to note, that in one season, I captured eighteen species around the piazza lights of the Waumbek Hotel, at Jefferson.

Since announcing my interest in *Plusia* I have received the most liberal assistance from collectors everywhere. Indeed, so many have aided me in one way or another, that I shall not attempt to mention them all by name, for fear of omissions. For the presentation of material from which I have made new types I must particularly thank all of those whose names are mentioned in connection with the descriptions. Great obligation is due to Sir Geo. Hampson, Mr. Schaus and Professor Smith for comparing material for me at different times, with the types and material in the British Museum. For comparing my insects with types I must likewise thank Professor French and Mrs. Fernald, the latter very kindly forwarding her type of *surena* to me at a time when it was presumably unique. I was able, however, to match it with a specimen in my own possession, but never really knew the species till Mr. Roland Thaxter kindly presented me with a magnificent fresh example which proved conclusively that only a poor description can be based upon a poor type. I should also specially mention Dr. Barnes, Dr. Bethune and Professor Smith, all three of whom not only presented me with specimens which proved to be new, but likewise forwarded me all of their material.

I must now indicate briefly the method which I have adopted in working out the synonymy, in order that subsequent students may fairly determine upon the value of my deductions. Having obtained, as far as possible, copies of all the descriptions of species listed as North American, I first endeavored to satisfy myself of the correctness of my labels by comparing material with descriptions. I very soon gave this over as unsatisfactory because it could not be certain beyond possibility of doubt. The earlier description may have been adequate when made, but in many instances, the subsequent discovery of other species closely allied has rendered the descriptions unsatisfactory, fitting as they do several forms almost equally well. An author, knowing but a few species, necessarily was ignorant of the very characteristics which prove most reliable as distinguishing marks, and therefore failed to record them at all. On the other hand many considered the metallic sign of great specific value and often minute description of

this mark is given. A study of all the *Plusias* shows that it is not at all reliable. It is variable among individuals of the same species (sometimes differing even in the two wings of the same insect); and again is identical in species which are quite distinct.

In this dilemma I decided as far as possible to obtain access to the types, in order to know what had been before the authors. I have myself made comparison with the types in the Neumoegen and Edwards collections in New York, and with the types in the National Museum. Mrs. Fernald sent me the type of *surena*, and Professor French made comparisons for me with his type of *lenzii*. I sent about forty species to the British Museum where Sir Geo. Hampson made comparisons for me, naming the specimens as they agreed with types or material similarly named. I should mention that my material was sent to him without labels of any kind, being merely numbered so that the correct labels could be replaced on their return. Some of these identifications proving quite unexpected to me, I decided to verify the work, and intrusted to Mr. Schaus a similar lot of insects including some species not forwarded at first, and he very kindly went over the ground again, comparing my material with the types and material in the British Museum and labeling them according to his identifications. Even this left a few points in doubt and I took advantage of Professor Smith's kind offer to make comparisons for me, and on his last visit to Europe he looked up several species for me and wrote out his opinions.

From the comparisons which have been made for me I find that the tendency in the British Museum is to "lump" species. Several of our American species have come back to me with Old World names. It is not unnatural perhaps, for the custodians of a great world collection such as is in the British Museum to place side by side all insects which resemble one another, looking upon countries or even continents as mere localities, and the resulting aggregation as simply a "series." To make my meaning plainer, I take it that in the British Museum collection, Canada, the United States, Brazil, Chili, England, Germany, Russia, Siberia, India, New South Wales, Egypt, etc., have about the same value on labels, as Pennsylvania, Florida, Illinois, California, etc., would have in a North American collection. In a world series of this character apparently, the first name published is attached to the "series," and all others are counted as synonyms.

Whilst I shall not attempt even to contribute my views to the moot question: "What is a species," I will say most emphatically that I cannot at present follow the example of the British Museum. Even in a final universally adopted classification I doubt that names from the four quarters of the world will be, or should be, dumped into the synonymy. At best even in a species distributed all over the world we should have races and such races should have names. With such a scheme generally adopted I should not object to considering *californica* the American race of *gamma*, and *putnami* the American race of *festuæ*, but for the present I retain the American names of these and other species as distinct, or at least distinguishing; for aside from other considerations, I am able to separate all the American forms from their nearest Old World relatives by superficial examination alone. Moreover, so far as I have gone in the examination of genitalia, they are separable by that means.

There is a word to be said about the value of names. A name always stands as a record of work. It may not have been good work, and an error may have been committed; nevertheless the name and the work back of it should not be discredited without reasonable certainty that the name represents duplication, and I hold that the wider apart the localities of the types the less likelihood is there of duplication. If a name from Africa must go into the synonymy because a man in Germany thinks there is but one species flying both in Africa and Asia, it is not unlikely that some future worker with African material, finding a form without a recognized name, will rename the species, and thus the German gentleman will have caused the very duplication which he endeavored to obviate.

Adopting the generic separation proposed by Dr. Dyar, I append the following list of species belonging to the *Plusia* group. In doing so, I wish future students to take into consideration the fact that I have in my personal collection examples of every species listed as valid, except *pedalis*, which is known only by the type; and *ornata* and *epsilon*, both described by myself, the types being unique specimens in National Museum collection; nor have I *palligera*, nor *morigera*, but the types being in the Edwards collection have been easily accessible. In regard to *pedalis*, the description of which is meager, I have a colored drawing made for me from the type, as I have of numerous other types, by which means I have satisfied myself of the comparisons made for me by others. I have also the opinion of

Professor Smith, who personally examined the type of *pedalis* that it is distinct from anything in my collection.

Polychrysia *Hbn.*

- ✓ *trabea* Sw.
- ✓ *formosa* Grt.

Panchrysia *Hbn.*

- ✓ *purpurigera* Walk.
- ✓ *palligera* Grt.
- ✓ *morigera* Hy. Edw.
- ✓ *ornata* Ottol.

Plusia *Ochs.*

- ✓ *ærea* Hbn.
- ✓ *æroides* Grt.
- ✓ *balluca* Geyer.
- ✓ *metallica* Grt.
- ✓ *scapularis* Hy. Edw.
- ✓ *lenzii* FRENCH.

Euchalcia *Hbn.*

- ✓ *venusta* Walk.
- ✓ *striatella* GRT.
- ✓ *contexta* Grt.
- ✓ *putnami* Grt.

Eosphropteryx *Dyar.*

- ✓ *thyatiroides* Guen.

Autographa *Hbn.*

- ✓ *mappa* G. & R.
- ✓ *bimaculata* Steph.
- ✓ *u-brevis* GUEN.
- ✓ *biloba* Steph.
- ✓ *solida* Ottol.
- ✓ *californica* Speyer.
- ✓ *russea* Hy. Edw.
- ✓ *pseudogramma* Grt.
- ✓ *labrosa* Grt.
- ✓ *corrusca* Strk.
- ✓ *ou* Gn.
- ✓ *fratella* GRT.
- ✓ *pedalis* Grt.
- ✓ *arctica* Ottol.
- ✓ *verruca* Fabr.
- ✓ *rutila* WALK.
- ✓ *precationis* Guen.

rogationis *Guen.*

- ✓ *dyaus* GRT.
- ✓ *inclusens* WALK.
- ✓ *hamifera* WALK.
- ✓ *culta* LINT.

brassicæ *Riley.*

- ✓ *echinocystis* BEHR.

oxygramma *Speyer.*

- ✓ *indigna* WALK.

abrota *Druce.*

egena *Gn.*

flagellum *Walk.*

- ✓ *monodon* GRT.
- ✓ *insolita* SM.

rubidus *Ottol.*

rectangula *Kirby.*

- ✓ *mortuorum* GUEN.

✓ **alias** *Ottol.*

octoscripta *Sand.*

✓ **altera** *Ottol.*

epsilon *Ottol.*

✓ **zeta** *Ottol.*

✓ **varianna** *Ottol.*

vaccinii *Hy. Edw.*

✓ **pallida** *Ottol.*

angulidens *Sm.*

✓ **excelsa** *Ottol.*

celsa *Hy. Edw.*

selecta *Walk.*

- ✓ *viridisignata* GRT.

✓ **v-alba** *Ottol.*

epigæa *Grt.*

ampla *Walk.*

- ✓ *alterna* STRK.

surena *Grt.*

✓ **speciosa** *Ottol.*

falcifera *Kirby.*

- ✓ var. **simplex** *Guen.*

✓ **simplicima** *Ottol.*

pasiphæa *Grt.*

✓ **albavitta** *Otto!*

basigera *Walk.*

- ✓ *laticlavata* MORR.

diasema *Bdv.*

sackeni Grt.**snowi** Hy. Edw.**Syngrapha** Hbn.**devergens** Hbn.(?) *alticola* WALK.**hochenwarthi** Hoch.**ignea** Grt.**parilis** Hbn.*quadriplaga* WALK.**Polychryisia trabea** Sm.

This is very close to *moneta* of Europe. My European specimens are from Germany and are somewhat darker, more orange colored. My specimens of *trabea* agree with the type and are from the same locality, but I have been unable to obtain male specimens, and thus have not examined the genitalia.

Panchryisia Hub.

The type of *purpurigera* is in the British Museum. The species is well known and widely distributed. (Pl. VII, Fig. 1.) The types of *morigera* and *falligera* are both in the American Museum of Natural History, Edwards Collection. I have seen no others. The type of *ornata* is in the National Museum.

Plusia æreoides Grt. (Pl. VII, Fig. 3.)

My material compared with type in British Museum.

Plusia balluca Geyer. (Pl. VII, Fig. 9.)

My material compared with type in British Museum.

Plusia metallica Grt. (Pl. VII, Fig. 7.)

The type of *metallica* is in the British Museum; a specimen of mine identified by comparison with the British Museum type of *metallica* also agrees with the type of *scapularis* in Neumoegen Collection; it was then forwarded to Professor French who returned it to me labeled *lenzii*, at the same time writing to me "this is straight enough *lenzii*."

Euchalcia venusta Walk. (Pl. VII, Fig. 11.)

My material identified by type in British Museum; *striatella* Grote is the same species.

Euchalcia contexta Grt. (Pl. VII, Fig. 12.)

My material identified by type in British Museum where the species is queried, however, as a variety of *festuca*, an evidence of the tendency towards lumping.

Euchalcia putnami Grt. (Pl. VII, Fig. 13.)

Professor Smith in his Catalogue of Noctuidæ records the type as being in the British Museum. It is not there at present. The species

is lumped with *festuca*, despite the fact that Mr. Grote published valid reasons for separating them. The genitalia are similar but not identical. Moreover there are possibly two or even three similar forms on this continent, which may be separable later by the genitalia and other characteristics. More material and further study is required to determine this.

Eosphoropterxy thyatiroides *Guen.* (Pl. IX, Fig. 12.)

My material identified by comparison with type in British Museum.

Autographa bimaculata *Steph.* (Pl. VII, Fig. 5.)

The type of *u-brevis*, said to be synonymous, is credited by Professor Smith, in his Catalogue of Noctuidæ, to the British Museum. My material sent there for identification is labeled as agreeing with their specimens of *bimaculata*, but no reference is made to *u-brevis*. Either the type is absent, or else is perhaps mixed with the *bimaculata* specimens. There seems no reason however to doubt the synonymy. I may record here my belief in a distinct form in the Northwest, which on further study may merit a name, either as a geographical race, or else as a new species.

Autographa solida, sp. nov. (Pl. VI, Fig. 5.)

Coloration exactly as in *metallica*—ground color creamy fulvous, shadows, especially apical and median spaces, darker with metallic golden scales interspersed, secondaries and fringes concolorous. T. a. line faint or absent above the median vein, below the vein incurved from the sign to the lower border of the wing, sharply defined, metallic. T. p. line thread-like, neat, two outward curves, one towards apex, one opposite the large silver sign; one inward curve between the two signs. The sign is metallic silvery, bilobed, the space between the lobes somewhat less proportionately than in *biloba*. The inner half of the sign lies with a flat border against the median vein, the outer half being entirely below the vein. Above the vein, just where it branches is a second silver spot, much smaller, ovate, lying horizontally (the wings spread) practically solid, though a minute speck made up of the golden brown scales cuts the spot upwardly. At the apex there is an ovate upright spot of golden brown, with a prolongation pointing down and reaching the t. a. line opposite the smaller silver sign. Along the costa near the thorax is a well-defined silver spot, pyramidal with its apex dull, its base on the vein. Secondaries slightly darker towards the base. Expanse, 30 mm.

Habitat: Texas; Mexico and south.

Type: With the author.

This specimen, from Texas, was a unique in the collection of Mr. Herman Strecker from whom it was obtained, by the author (*mirabile dictu*). A second specimen, from Mexico, was presented by Mr. Wm.

Schaus who says that the species is not uncommon in Mexico where it is confounded with *biloba*. The Mexican specimen is darker than the type. *Solida* differs from *biloba*, in its smaller size, very different, lighter color; and the solid upper silver spot, which in *biloba* is simply an ovate line open below. There is also a very distinct dash extending from the t. p. line outwardly to the fringes, about the center of the wing in *biloba*, which is entirely absent in *solida*.

Autographa californica Speyer. (Pl. VIII, Fig. 11.)

This name brings us to one of the most argued questions. My material sent to the British Museum for identification is returned with the statement that *pseudogamma* (Pl. IX, Fig. 8), of which they have the type, is placed with *californica*. Professor Smith in his Catalogue of Noctuidæ lists *gamma*, with the expressed opinion that *californica* is the western and *pseudogamma* the northern form of *gamma*. Later he lists *ou*, with *californica* and *russea* as varieties.

The genitalia of *californica* and *pseudogamma* are distinct, which will satisfy Professor Smith as to the separableness of the species. The same, in a somewhat lesser degree, is true of *californica* and European specimens of *gamma*. In regard to locality I have *californica* as far north as Calgary and as far east as Syracuse, N. Y. I have *pseudogamma* from Calgary and from the White Mts. In short it flies in the same regions with *californica*. Professor Smith's reference of *californica* to *ou* is interesting. It is quite distinct from *ou* but in *pattern* it does resemble *gamma*, while in coloration, *gamma* in turn might be mistaken for *ou*. *Californica* is subject to much variation, but as distinguished from *gamma* it is a contrasty species, while *gamma* is suffused in color. Twenty-four specimens of *californica* are before me, and twelve of European *gamma*, and viewed as a group the two forms are readily distinguishable. The most contrasty specimen of *gamma* perhaps might be confused with the most suffused of *californica*. The twelve of *gamma*, compared with a like number of *ou* (the latter including Mexican examples), require a study of the pattern for differentiation, the color scheme being the same. *Russea* is only a rather reddish form of *californica*, aberrational rather than varietal. *Fratella* is a starved *ou*. I have a specimen agreeing exactly with the type in size as well as pattern. Coming from a torrid locality we may well imagine a scarcity of food, and it is interesting to note that I have an equally small *californica* from an ice-clad region.

Autographa labrosa Grt. (Pl. VII, Fig. 14.)

My material compared with type in British Museum.

Autographa corrusca Strecker. (Pl. VII, Fig. 15.)

One of my specimens was obtained from Mr. Strecker and is labeled by him as agreeing with the type.

Autographa arctica, sp. nov. (Pl. VI, Fig. 11.)

Dull brown, the only gray shades being along the costal end of t. p. line, and at inner angle. The terminal line is also gray. T. a. line, three short outward curves, below the median vein. T. a. line begins with a hook at costa, descending fairly straight, inwardly bent, trembled. It is fairly distinct. The s. t. line black, apical outcurve rounding. Orbicular distinct, outlined in black, lies immediately in the course of the t. a. line. Reniform, outlined in black. Sign, golden, shaped as in *gamma*. Secondaries brownish, lighter at the base, crossed by yellowish band. Fringes cut. Expands, 32 mm.

Habitat: Alaska.

Type: 6258 in National Museum.

Described from eight specimens found in the collection of National Museum, Washington, D. C. Taken by L. M. Turner, September 5, 1880, at Alter Islands, Alaska. Co-type with the author, and Professor Smith also has specimens. The species is allied to *interrogationis*, from which however it is abundantly distinct, a good series of *interrogationis* with its variations having been examined. The genitalia also differ.

Autographa verruca Fabr. (Pl. VIII, Fig. 2.)

Rutila Walk., is a synonym. The type of Walker's species is in the British Museum.

Autographa precatationis Guen. (Pl. IX, Fig. 6.)

My material agrees with type in British Museum.

Autographa rogationis Guen. (Pl. IX, Fig. 1.)

Dyaus Grt., *includens* Walk., and *hamifera* Walk., I accept as synonyms. The British Museum adds the following also to the synonymy; *criosima* Doubl., from New Zealand; *chrysosema* Zell.; *acuta* Walk., from Congo, South Africa; *adjuncta* Walk., from Moreton Bay, Australia. All of Walker's types are in the British Museum, but considering the localities I am not willing to assume any responsibility of connecting so many names, especially so many from a single author. I add *culta* to the synonymy on the following evidence. I examined the type of *culta* in the presence of Professor Lintner, and he gave me

one of two accompanying specimens which he declared were from the original lot. I make this statement as authenticating my specimen, because since Dr. Lintner's death I have been unable to find the type in the Albany collection. My *culta* is merely a small example of *rogationis*. Fortunately it was a male, and I succeeded in obtaining the genitalia. It is absolutely identical with that of *rogationis*, and is so remarkably distinct from all other of the *Plusias* in its extremely long slender clasper that the worst skeptic in regard to the value of genitalia, would I think accept the evidence.

Autographa brassicæ Riley. (Pl. IX, Fig. 11.)

My specimens agree with Riley's type in National Museum. I have a specimen sent to me by Professor Behr labelled by him *echinocystis* which authorizes my placing Behr's name in the synonymy.

Autographa oxygramma Speyer. (Pl. IX, Fig. 10.)

Indigna Walker is a synonym. The type of *indigna* is in the British Museum, my material agreeing with it.

Autographa abrota Druce. (Pl. IX, Fig. 4.)

This is a new name in our list. It was communicated to me by Dr. Barnes, he having received it from Florida. Its general appearance is somewhat like *oxygramma* in coloration and wing shape; though the apices of *abrota* are more rounded. There is an extraordinary development of hairs along the abdomen and the genitalia are so totally different from other *Plusia* forms that it may be removed from the present genus in the future. I supposed it to be a new species when received, but sent it to England with the material intrusted to Mr. Schaus, and he found that it agrees with the type of *abrota* in Mr. Druce's collection. It was described from Mexico.

Autographa flagellum Walk. (Pl. IX, Fig. 9.)

My material agrees with the types of *flagellum* Walk., and *monodon* Grt., both of which are in the British Museum. Also with the type of *insolita* Smith in the National Museum.

Autographa rubidus, sp. nov. (Pl. VI, Fig. 4.)

Color golden brown overcast with lighter shades of purplish pink. T. a. line curved outwardly, faint above the median vein, below the vein distinct, metallic, connected with the sign. T. p. line very faint, a succession of slight outward curves between the veins, very oblique from costa to the sign, and then descending more directly. S. t. line faint, curved outwardly near apex, and two similar smaller curves

opposite the sign. Terminal line of the lighter shade, thread-like, distinct in contrast to the fringes; the latter cut.

The sign is metallic, made up of two lines curving downward and outward from median vein, meeting in a sharp point. Described more generally, conspicuous features of the pattern are a bright oblique patch of the lighter color near the apex, showing conspicuously against the darkest part of the s. t. line, at the large curve thereof. Just below the sign is a long narrow patch of golden scales.

Secondaries yellowish at the base, with wide border of dark brown. Expands 35 mm.

Habitat: Manitoba; New Brunswick.

Type: Female in collection of the author.

Described from three specimens. The first was sent to me by Mr. A. W. Hanham, of Winnipeg, but had been taken by Mr. E. Fernstone Heath at Cartwright, Manitoba, in September. A second specimen was received from Mr. Heath direct, and a third from Mr. W. McIntosh, of St. John, New Brunswick.

Autographa rectangula Kirby. (Pl. VIII, Fig. 12.)

Here we lose one of our best known names, *mortuorum* Gn. The description of *mortuorum* seemed to apply to our species so poorly that I was much in doubt. The species, as all American collectors know it, is prominently silvered. In the description there is slight reference to this characteristic. However, Professor Smith personally examined Guenee's type in the British Museum for me, and states that, though showing less silver than usual, "it is undoubtedly our species." This relegates the name to the synonymy. Kirby's postscript to his description of *rectangula* is more helpful than his description; he says: "The silvery rectangular spot in the primary wings of this insect, when they are brought near to each other, forms a quadrangular area very much resembling a picture in a silver frame." This identifies the *mortuorum* of American collections at once.

Autographa u-aureum Guen.

Probably all American collectors imagine that they have this species. It is an instance of a false identification which has become perpetuated. The description does not fit the American species which has been carrying the name, at all. A specimen of the American *u-aureum* comes back to me from the British Museum labeled "*u-aureum* Gn., var. of *mortuorum*?" Another evidence of the desire to lump. A specimen of our *vaccinii* also is returned labeled "*u-aureum*." A specimen of *angulidens* was labeled "*angulidens*

var. *u-aureum*?¹¹ These labels, however, led to a comparison of the description with *vaccinii* with which it agrees better than with any other American species. But *vaccinii* is almost the most localized of all of our species so far as now known, being absolutely confined to the summit of Mount Washington and neighboring peaks, and has never been authentically reported below the tree line. *U-aureum* having been described from a Swedish locality, and the description associating it with *interrogationis*, we may safely drop it from our list.

This renders it needful to name the species which has so long passed as *u-aureum*, for which reason I have nominated it *Autographa alias*.

Autographa alias, sp. nov. (Pl. VIII, Figs. 7 and 13.)

This is a species best described by a figure; even accurate word description of the usual lines, signs and spaces would be almost as applicable to several other closely allied but positively distinct species, the nearest being *rectangula* (*mortuorum*). *Alias* is the species which has so long borne the name *u-aureum* in American collections, the latter however being quite distinct and nearer to our *vaccinii*. The pattern is practically the same as in *rectangula*. The sign is identical in shape and color, silvery. In a long series before me (twenty-four specimens) there are all gradations of coloration from a suffused form with indistinct lines, and no silvering, except the sign, to a form with sufficient contrast to render the lines, especially the s. t. line quite distinct, a great deal of silvering being present, especially at base of primaries. As *rectangula* also varies in the degree of silvering, from a form almost all silver to one having very little, it is needful to say that there is never so much silver in *alias* as in *rectangula*, and that the space between the t. p. line and the s. t. line is always dark and free from silvering, while in *rectangula* the same is always silvery in proportion to the rest of the wing. The genitalia are distinct. Expands, 32 to 34 mm.

Habitat: Common throughout the Northern States and Canada.

Type: Male in collection of the author.

Autographa altera, sp. nov. (Pl. VIII, Fig. 9.)

Allied to *octoscripta*, which it very closely resembles. It becomes essential, therefore, to indicate the differences. The color of *octoscripta* is blackish in the darker shadows, grayish in the lighter parts. Usually the darker shades greatly predominate. In *altera* the darker shades are brown, and the lighter a sort of gray overcast with purplish. The dark and light shades are about evenly distributed. The t. p. line in *octoscripta* is waved, fairly straight, conspicuous, and whitish. In *altera* it is in longer curves, more bent, very faint and indistinct. The s. t. line in *octoscripta* is black, square at the bend near the apex. In *altera* the same part of the s. t. line is only slightly extended outwardly and is dentate. The outer border of *octoscripta* is only slightly paler than the rest of the wing, while the terminal line and fringes are conspicuous. In *altera* the terminal line and fringes are concolorous with the space without the s. t. line, which thus appears as an outer

band, much paler than rest of the wing. The orbicular and reniform are easily seen in *octoscripta*, very inconspicuous in *altera*. The sign in the type is metallic, a silver V with a dot outwardly, disconnected. In a second specimen, however, the sign is as in typical *octoscripta*. The secondaries in *octoscripta* are yellowish at the base, and show a wide blackish border. In *altera* they are brownish, slightly darker outwardly, crossed by a yellowish band. Expands, 29 mm.

Habitat: Adirondacks and Canada.

Type: Female, with the author.

Described from a specimen taken at Lake Nepigon, Aug. 22, 1888, by Dr. Bethune, a second specimen taken by Dr. Chas. McKnight in the Adirondacks also in August. *Altera* is smaller than *octoscripta* with wings proportionately wider. Measured along the costa from the thorax to the apex, the primary of *altera* is 15 mm., and from apex to hind angle, 10 mm. *Octoscripta* measured similarly gives a wing 20 mm. by 10 mm. Fine specimens of both are before me.

Autographa epsilon *Ottol.* (Pl. VI, Fig. 8.)

This species, which is figured herewith, was described in the Proceedings of the Washington Academy of Sciences, Vol. II, pp. 494-495.

Autographa zeta, sp. nov. (Pl. VI, Fig. 1.)

Chocolate brown, the base, outer border and a small area near the costa between the t. p. and s. t. lines of a purplish gray, affording a sufficient contrast to render the lines distinct. T. a. line three short outcurves below the vein, seemingly yellowish or purplish metallic. T. p. line, geminate, waved, with one inward dentation opposite the sign. The s. t. line as usual, the apical outcurve dentate, rather than squared. The line is blackish, heavy near the apical outcurve, distinct throughout. Orbicular, large, outlined with gray. Reniform small, black, seemingly horizontal, else there is an extra black spot outwardly. The sign is white, satiny, somewhat like the Greek letter zeta, lying horizontally. Immediately under and beyond the sign, the brown color is deepest, fading away in all directions. Secondaries brown, with inconspicuous lighter bar crossing centrally. Fringes cut. Expands, 35 mm.

Habitat: Northwest Territory.

Type: Female, with the author.

Described from one female presented by Mr. Jacob Doll, having long been in his collection. It is noteworthy that the wings are unusually wide, measuring 17 mm. along the costa, and 13 mm. from apex to hind angle.

Autographa variana, sp. nov. (Pl. VI, Fig. 10.)

Again we have a species where description needs the assistance of the figure, which fortunately is quite good. In pattern it follows the *rectangula*, *alias* group.

Its great contrast of dark brown and pearl gray renders it at once recognizable. The sign is similar in shape, but golden rather than silver. The t. p. line is a succession of short waves; the same line in *alias* being three long, gentle curves. The s. t. line at its first outward curve, is dentate and nearly or quite touches the terminal line; in *alias* this part of the line forms three sides of a square, the two angles being slightly obtuse. Opposite the sign, the first dentation in the s. t. line is prolonged to the terminal line. This is not true in *alias*. Secondaries yellowish with broad dark brown border. Fringes cut. Head and thorax pearl gray. Collar and patagiae outlined in blackish. Expands, 33 mm.

Habitat: New Brunswick.

Type: Female, with the author.

Described from a single perfect specimen, captured by Mr. W. McIntosh, at St. John, N. B.

Autographa vaccinii Hy. Edw. (Pl. VIII, Fig. 3.)

A good series taken by myself on Mt. Washington agree with the type in the Edwards Collection, American Museum of Natural History.

Autographa pallida, sp. nov. (Pl. VI, Fig. 7.)

Another of the *rectangula, alias* group. Exceedingly pale brown with lighter shading. Immediately recognizable by the sign, which is similar to that of its congeners only reversed, the outer and inner parts of the sign being connected below instead of towards the median vein as in *rectangula, alias* and *variana*. The sign seems to be white, though in a truly fresh specimen it may prove to be silver. The t. p. line is waved as in *variana*. The s. t. line is more or less dentate throughout. Secondaries pale brown, darker towards the outer border, crossed by a band of much lighter (whitish) color. Fringes white, cut. Expands, 33 mm.

Habitat: Newfoundland.

Type: Female, with the author.

Described from two females, taken in Newfoundland, by Mr. Roland Thaxter.

Autographa angulidens Sm. (Pl. VIII, Fig. 5.)

My material identified by comparison with type in National Museum. I have never seen typical specimens of this, from any locality except Colorado, and all that I have seen from Colorado—and I have seen a great number—appear typical and constant in size and in pattern. *Angulidens* (?) from other localities, so far as I have seen, have all been my new species *excelsa*.

Autographa excelsa, sp. nov. (Pl. VI, Fig. 3.)

Closely allied to *angulidens*. Indeed, absolutely fresh specimens are needed in order to identify one from another, unless locality be considered. I have seen very numerous examples of *angulidens*, but never from any locality except Colorado, in

which respect it is like *vaccinii*, which is found nowhere except above the tree line in the White Mountains. On the contrary, I have *excelsa* from the White Mountains and from Laggan, British Columbia. In *angulidens* there are strong contrasts of coloration, the lines showing distinctly against the lighter grayish shadows. In *excelsa* the color scheme is a suffusion of two shades of brown. In regard to color, the two species separate just as *californica* differs from the European *gamma*. Perhaps the surest superficial guide by which to separate *excelsa* from *angulidens* will be by the sign. In both it may be either white or golden. In *angulidens* the inner sign is like the letter U, lying slightly obliquely, the open ends curving inwardly. In *excelsa* this part of the sign is rather V-shaped, a slight inward crook however occurring on the end of the outer branch of V. The outer dot may be large, small or absent from either species. *Excelsa* is smaller than *angulidens*, the latter expanding 36 mm., the Laggan examples of *excelsa* reaching only 30 mm. A New Hampshire specimen (female), however, reaches 34 mm. in size.

Habitat: Northern United States and Canada.

Type: Female, with the author.

The type was taken by the author in Jefferson, N. H., with others like it, which have gone to other collectors as *angulidens*. One is with Mr. Thaxter. Three others before me are from Laggan, and I have seen a great many more from that locality, all very much smaller than *angulidens* which seems quite uniformly large. I should mention that the genitalia of the two species differ.

Autographa celsa Hy. Edw. (Pl. VIII, Fig. 4.)

My material identified by comparison with type in Neumoegen Collection, Brooklyn Institute, and with type in Edwards Collection American Museum of Natural History.

Autographa selecta Walk. (Pl. IX, Fig. 7.)

Selecta Walk., and *viridisignata* Grt., are both represented by type in the British Museum and material sent there for comparison is returned bearing the two names, Grote's name, the better of the two, unfortunately passing into the synonymy. I feel obliged to call attention to a fact in relation to the sign, in spite of what I have said of its slight value. Grote describes the sign as "a peculiar greenish-golden hue—verdigris-like." I have one specimen to which the words "peculiar-greenish-golden," seem most applicable. Four others are green. I once had a wreck of this species sent to me in an envelope. The two primaries however were in sufficiently good condition for identification (for which purpose the specimen had been forwarded) and the sign was quite golden. The variation then would seem to be from green to gold through the various intermediate stages. It is a

little odd therefore to read in Walker's description "discal mark silvery." This is the sort of thing that makes identification from written descriptions so easy (sic?).

Autographa v-alba, sp. nov. (Pl. VI, Fig. 2.)

Color with grayish shades delineating the pattern. T. a. line, outcurved, grayish against an outer shading of dark brown. A break occurs above the median vein, the line at the costa showing as a light and a dark spot adjacent. T. p. line similarly geminate, the darker lining now occurring inwardly of the lighter line; gently curving outwardly from the costa and inwardly near the median space, dentate opposite the sign. S. t. line distinct, occurring as the sharp outline of the brownish band, against the lighter, grayish outer border, one outcurve from the costa to the median vein; two teeth opposite the sign. Orbicular small, dark, lying in a gray field between the costal terminations of the t. a. line, and the sign. Reniform faint, lined with thread of white, against broad blackish. A blotch of dark brown connects it with the costa. The sign is a V, the open ends touching the median vein, approximately white, not metallic. Fringes cut. Secondaries fuscous, darker towards the border. Expands, 40 mm.

Habitat: Wyoming.

Type: Female, in the collection of the author.

Described from a single specimen taken in Yellowstone Park, Wyoming, by Dr. William Barnes.

Examination of the figure shows one wing apparently darker than the other. This is accounted for probably by staining. The description, therefore, is made from the lighter wing, and a fresh specimen should show strong contrasts in the shading. Its large size and thin vestiture would place this with *celsa*, *ampla* and *epigæa*, but in color scheme and pattern it is very close to *surena* and *speciosa*. It would not be strange, when other specimens are taken, to find the V sign accompanied by a dot, either separated or connected.

Autographa epigæa *Grt.* (Pl. VII, Fig. 16.)

My material agrees with the type in British Museum.

Autographa ampla *Walk.* (Pl. VII, Fig. 6.)

My material agrees with type in British Museum. A specimen obtained from Mr. Strecker and labeled by himself as agreeing with his *alternata*, authenticates my statement as to synonymy.

Autographa surena *Grt.* (Pl. VIII, Fig. 10.)

My examples identified by the type kindly loaned by Mrs. Fernald.

Autographa speciosa, sp. nov. (Pl. VI, Fig. 9.)

Color chocolate brown, lines and shadows pearly gray. Coloration same as in *surena*; fresh specimens of both required for comparison, as in old or flown speci-

mens the gray shades are lost. T. a. line a strong outcurve from costa to median vein, gray against a strong brown blotch at costa. Below the vein distinct, slightly oblique, outwardly bent, gray, apparently crossing the solid chocolate brown of the median space, the brown appearing inwardly of the line as a second line paralleling it. The t. p. line faint from the costa to median vein, distinct, geminate below, grayish; it is fairly straight, inwardly bent. The space between the t. p. line and the s. t. line wider than usual, unicolorous, brown. Outwardly of the s. t. line the border is lighter, a mixture of the brown and gray shading. The s. t. line distinct as a demarcation between these two areas, as usual, outcurved near costa, with two dentations opposite the sign. Orbicular indistinct, grayish. Reniform more easily seen, blackish with gray outlines, a yellowish splotch between it and the costa. The sign is white and shaped as in the *gamma* group. Secondaries pale yellowish-brown, lighter at the base. Fringes cut. Expands, 34 mm.

Habitat: Corfield, Vancouver.

Type: Female, with the author.

Described from a single specimen taken by Mr. Clermont Livingston at Corfield, Vancouver. This is one of the most beautiful of our species, and for a new form, very satisfactorily distinct.

***Autographa falcifera* Kirby.** (Pl. IX, Fig. 2.)

Kirby's description undoubtedly applies to our common insect known as *simplex*. Fortunately he described the gray form; thus *simplex* is properly retained for the brown form as a varietal name. *Falcifera* was named from Nova Scotia, and it is noteworthy that in the north the brown form is rare. *Simplex* was described from New York where the brown form is common. This seems to be the only species thus far known to me, having an authentic varietal form, the genitalia of both gray and brown specimens being identical.

***Autographa simplicima*, sp. nov.** (Pl. VI, Fig. 6.)

Color dull brown, slightly darker in median space. T. a. line absent above the median vein; below the vein oblique, neat, metallic, inconspicuous. T. p. line, oblique, slightly waved, very faint. S. t. line starting absolutely at apex, oblique, faint, gently curving. The sign as in *falcifera*, only very small, and terminating in an acute angle. Secondaries concolorous, crossed centrally by lighter band. Expands, 28 mm.

Habitat: Washington.

Type: Female, with the author.

Described from a single female presented by Professor John B. Smith. This closely resembles the *simplex* form of *falcifera*, but is much smaller, suffused in color, and easily identified by the acute termination of the sign, which is always knobbed in *falcifera* and *simplex*. I had intended to write the name *simplicissima*—simplest—

but by an error of transcription it was sent to Dr. Dyar as *simplicima*, which being shorter may stand with this explanation of my meaning.

Autographa pasiphæa Grt. (Pl. IX, Fig. 14.)

My material agrees with type in British Museum.

Autographa albavitta, sp. nov. (Pl. VIII, Fig. 8.)

Pale brownish cream with base and terminal border of primaries, lines and fringes whitish. T. a. line inwardly oblique from costa to median vein, outwardly curved below the vein. T. p. line wide, prominently outcurved near apex, continuing downward as one gentle incurve. Between the t. p. and s. t. lines the darker color appears as a wide band crossing the wing. At the central part of the terminal space there is a prominent rectangular blotch, the darkest color in the pattern. This is crossed by the vein, which divides it almost equally. There is a pale blotch at the apex. The reniform, orbicular and sign are clearly outlined each by a fine yellowish line inclosing the ground color. Secondaries concolorous, crossed centrally by a faint band of lighter color. Collar, patagiæ, thorax the same, shaded with the lighter color. Fringes of all four wings, whitish, cut with darker shade. Expands, 30 mm.

Habitat: Middle California.

Described from a female, in the collection of Dr. Barnes, with whom the type remains.

This is placed among the *Plusia* group only tentatively. The discovery of a male may render it possible to more correctly classify it.

Autographa basigera Walk. (Pl. IX, Fig. 5.)

This is the *latilavina* of Morr. The type of *latilavina* is reported to be in the Tepper collection to which I have not had access. My material agrees with the type of *basigera* in British Museum, where the synonymy is made to include *adinomens* Walk., and *intracta* Walk., but not knowing the localities from which these latter were described I prefer not to intrude the names in the American list.

Autographa sackeni Grt. (Pl. VIII, Fig. 17.)

My material agrees with type in British Museum.

Autographa snowii Hy. Edw. (Pl. VIII, Fig. 16.)

In nearly all collections, and in the British Museum collection, this specimen is considered synonymous with *sackeni*, but it is very questionable whether authentic *snowii* is well known. I imagine that *sackeni* has been sometimes labeled *sackeni*, and sometimes *snowii*, so that when one collector has found himself possessed of both names he has judged the species to be identical. I have seen a plentiful number of *sackeni*, and they all meet the description accurately, except as

to the metallic sign, which is variable and varies towards the described sign of *snowi*. This may have aided in the confusion. I have not been able to obtain an identification from type, but I have a specimen from Mr. Doll, by him received from Professor Snow himself, the specimen still carrying a printed label reading: "Near Hot Springs, Las Vegas, N. M., 7,000 feet, Aug., '82. F. H. Snow." Thus I feel that I have a genuine *snowi*, especially as the description fits it absolutely. It is easily separable from any *sackeni* that I have seen. It is smaller, the apex of the wing is much less produced than in *sackeni* and the color is different. As words do not adequately describe color let me resort to comparisons: The color scheme of *snowi* is the same as in *simplex*, the browns and reds being identical in shade. The coloration of *sackeni* is nearer to but not exactly the same as *ampla*. Fresh specimens of *ampla* are needed to get the reddish hues. A spot at the base of the costa is orange in *snowi*; it is more sagittate in shape and very pale yellowish in *sackeni*. In brief, the two are distinct, and the descriptions of both should be sufficient for identification, being unusually accurate.

Sygnrappa devergens *Hbn.*

Professor Smith in his catalogue lists *alticola* as distinct, and places *ignea* Grt. as a synonym thereof. The type of *alticola* is in the British Museum where it is counted synonymous with *devergens*. I place the name therefore as a synonym, but with a query, as I doubt it. Later I think I shall be able to establish that *alticola* from Northwest Territory, is distinct from *devergens* of Labrador.

Syngrapha ignea *Grt.*

This type should be in the Philadelphia collection but I could not find it. It cannot be a synonym of *alticola* however as placed in Professor Smith's catalogue, its size alone separating it. My material agrees with specimens in British Museum labeled *ignea*, presumably obtained with the Grote collection. My material, including twelve specimens, some from Colorado, and others from Calgary, N. W. T., are uniformly an inch and a quarter in expanse (one or two females a trifle larger) which is exactly the measurement recorded in the description. For these reasons I restore the name, admitting however that my studies of the yellow-winged species are quite incomplete, owing to lack of male specimens. So far as I have found, the genitalia are a very distinguishing feature from other *Plusia* forms.

Syngrapha parilis *Hbn.* (Pl. VIII, Fig. 15.)

My specimens identified at British Museum. I am not sure whether the type of *parilis* is there or not, though from their labeling of my material I should think it is. The type of *quadriplaga* Walker, is there, however, and is identical.

In closing this paper I would add but a few words in regard to separation of species. A great many are very closely allied, and single specimens of two species might be supposed to be identical, the differences being so slight. A study of good series, however, shows that the differences, though slight, are constant, and therefore reliable. The same is true of the genitalia, which must be noted very closely, and I am told that this is also true of larvæ, species feeding together, and looking alike, yet emerging as distinct forms.

One of the seemingly slight divergences which is absolutely reliable in separating species I will mention. Especially in the *rectangula* group, species may often be known by their secondaries, even when the primaries are so worn as to make identification doubtful. Broadly speaking there are two patterns: in one the base of the wing is a dirty yellowish, the border being blackish. These we may call "bordered." In the other, the base of the wing is tinged with a lighter shade of the border color, thus producing an oblique band or bar of the yellowish shade, crossing the wing centrally. These are the "banded." Of the "bordered" forms *rectangula* is a good example, while *vaccinii* is a conspicuous example of the "banded."

**NOTES ON CALOCAMPA WITH DESCRIPTION
OF A NEW SPECIES.**

BY RODRIGUES OTTOLENGUI.

(PLATE X.)

Under this genus, Grote in his check list, 1882, listed three species, *nupepa*, *cineritia*, and *curvimacula*. In Smith's list, 1891, only two names are added to the above, *brucei* and *thoracica*, the latter having been described by Putman-Cramer as a variety of *cineritia*. I undertook a closer scrutiny of the genus because of the fact that I apparently had in my collection more forms than there were names in the latest list, excepting *brucei*, of which however I had access to the type. I believed that two distinct forms were mixed under *cineritia*, as now